

## *Gynodiastylis laciniacristatus*, a new species (Crustacea: Cumacea) from Australia

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**Abstract.**—A new species, *Gynodiastylis laciniacristatus* (Crustacea: Cumacea) is described from two disparate localities on the Australian shelf, the Bass Strait (Southeast) and the Dampier Archipelago (West), from depths of 48–85 m. The ovigerous female is completely figured. No males were collected. The new species is distinguished from all other species of *Gynodiastylis* by a large blunt process on the ischium of pereopod 4 and by the pattern of toothed ridges on the carapace. *G. mutabilis* Hale, 1946 and *G. ornata* Hale, 1946 have similar ridge patterns, however *G. laciniacristatus* has a distinct sharp corner on the anterolateral prominence of the carapace and rudimentary exopods on pereopods 3 and 4, in addition to the large blunt process on the ischium of pereopod 4.

The genus *Gynodiastylis* is known primarily from the Southern hemisphere. Hale (1946) described the great majority of the species in the genus, from the environs of Australia. A new and unusual species of *Gynodiastylis* was identified from the extensive cumacean collections of the Museum of Victoria and is described here, as part of an NSF PEET (Partnerships for Enhancing Expertise in Taxonomy) project.

### Methods

Samples were collected with the WHOI epibenthic sled or a Smith-McIntyre grab. Drawings were prepared using a *camera lucida* on a Wild compound microscope. Body length was measured from the tip of the pseudorostral lobes to the posterior border of the last somite. One ovigerous female was prepared for SEM (scanning electron microscope) photography.

Family Gynodiastylidae Stebbing 1912

*Gynodiastylis* Calman 1911

*Gynodiastylis laciniacristatus*, new species

Figs. 1–5

**Type material.**—Holotype (NMV J45433) 1 ovigerous female, Bass Strait, Australia,

39°49.0'S, 143°24.0'E, 56 m, 20 Nov 1981. Paratype (NMV J45434) 1 ovigerous ♀, Bass Strait, Australia, 39°49.0'S, 143°24.0'E, 56 m, 20 Nov 1981. Paratypes (NMV J45435) 1 ovigerous ♀, 1 subadult ♀, Bass Strait, Australia, 39°49.0'S, 143°24.0'E, 56 m, 20 Nov 1981. Paratype (NMV J45436) 1 ovigerous ♀, Bass Strait, Australia, 38°38.2'S, 142°35.0'E, 59 m, 20 Nov 1981. Paratype (NMV J45437) 1 ovigerous ♀, Bass Strait, Australia, 39°06.3'S, 142°55.6'E, 81 m, 21 Nov 1981. Paratype (NMV J45438) 1 ovigerous ♀, Bass Strait, Australia, 40°00.0'S, 144°20.9'E, 48 m, 22 Nov 1981. Paratype (NMV J45439) 1 ovigerous ♀, Bass Strait, Australia, 39°00.2'S, 144°33.9'E, 74 m, 23 Nov 1981. Paratype (NMV J45440) 1 subadult ♀, Bass Strait, Australia, 39°13.6'S, 143°55.6'E, 85 m, 23 Nov 1981. Paratype (NMV J45441) 1 subadult ♀, Western Australia, (damaged), 20°1.00'S, 117°11.00'E, 48 m, 11 Jun 1983. Paratype (NMV J45442) 1 subadult ♀, Western Australia, 19°38.00'S, 118°6.00'E, 49 m, 13 Jun 1983.

**Diagnosis.**—Carapace with depression sweeping dorsally from anterior edge, anterolateral prominence produced as sharp

corner, with dorsal ridge bounding prominence toothed, dorsal depression bounded by sharp lateral ridges, continuing through dorsum of pereon 5, anterior ventral margin toothed, antennal notch oblique. Pereopod 4 with large blunt process on ischium. Adult females less than 4 mm.

*Description*.—Ovigerous female, 3.5 mm. Carapace with dorsal depression, eyelobe present, no lenses; pseudorostral lobes 0.5 carapace length; antenna 1 visible, extending just past pseudorostral lobes. Pereonites 1–3 expanded ventrally as anteriorly directed flap, pereonites 4 and 5 directed posteriorly dorsally (Figs. 1A, 1B, 2A).

Antennule article 1 longer than articles 2 and 3 together, bearing 1 plumose and 2 simple setae proximally and 1 simple seta distally; distomedial margin with fine hair-like setae; article 2 bearing 1 simple and 1 plumose setae distally, medial margin bearing fine hair-like setae; articles 2 & 3 subequal in length, article 3 bearing 2 simple setae; main flagellum of 2 articles bearing 1 long annulate seta, 2 long simple setae, and 2 short simple setae terminally; accessory flagellum of 1 article with 2 terminal setae (Fig. 3A).

Mandible navicular, with 10 lifting setae; left side with stout lacinia mobilis, incisor quadridentate, right side with slender lacinia mobilis, incisor bidentate (Fig. 3B).

Maxillule of 2 lobes, outer broad lobe bearing double row of stout setae terminally, medial margin bearing fine hair-like setae; inner lobe bearing 2 tridentate, 1 long, 2 short setae terminally, medial margin bearing fine hair-like setae (Fig. 3C).

Maxilla of 3 lobes; broad lobe 4 times as wide as narrow lobe, medial margin bearing 9 simple setae, medial-distal corner bearing 2 plumose setae, distal margin bearing many simple setae; distal-lateral corner bearing 1 forked and 1 microserrate setae; inner narrow lobe bearing 2 microserrate and 2 simple setae apically; outer narrow lobe bearing 5 simple setae apically (Fig. 3D).

Maxilliped 1 basis as long as all other

articles together, produced as large distomedial lobe, lobe bearing several short simple setae distally, lobe bearing several plumose setae, setulose on distal 0.3 only; ischium not present, merus half as long as carpus, medial margin bearing fine hair-like setae; carpus bearing 3 blade-like, 3–4 bidentate, several simple setae medially, 1 long plumose seta distolaterally; propodus as long as carpus, half as broad, bearing 2 tridentate and 2 long plumose setae distally, margins with many fine hair-like setae; dactyl half as long and half as wide as propodus, bearing 4 small simple setae terminally (Fig. 5C).

Maxilliped 2 basis as long as next 2 articles together, bearing 3 long plumose setae distally; ischium not present; merus 0.5 basis length, bearing 2 plumose setae distally; carpus slightly longer than propodus, bearing 3 plumose setae medially; propodus bearing 2 long plumose setae distally and 3 plumose setae medially; dactyl half length of propodus, bearing 4 simple setae terminally; endite bearing 5 stout annulate setae and 2 simple setae (Fig. 2B).

Maxilliped 3 basis 2 times as long as next 4 articles together, medial margin bearing 8 plumose setae, lined with short hair-like setae, single plumose seta distally, distomedial corner produced as 2 teeth, lateral margin lined with fine hair-like setae, distolateral corner bearing 4 long plumose setae; ischium 0.5 basis width, slightly longer than merus, 1 plumose setae medially, otherwise margins lined with fine hair-like setae; merus 0.5 length carpus, produced as tooth at distolateral corner and bearing 1 plumose seta, medial margin lined with fine hair-like setae and bearing 1 plumose and 1 simple setae distally; carpus bearing 1 plumose seta on distolateral corner, medial margin lined with fine hair-like setae and bearing 1 plumose and 1 simple setae; propodus subequal to dactyl, bearing 1 simple seta on distolateral corner, medial margin bearing 2 simple setae; dactyl bearing 4 simple setae terminally (Fig. 3E).

Pereopod 1 basis as long as all other ar-



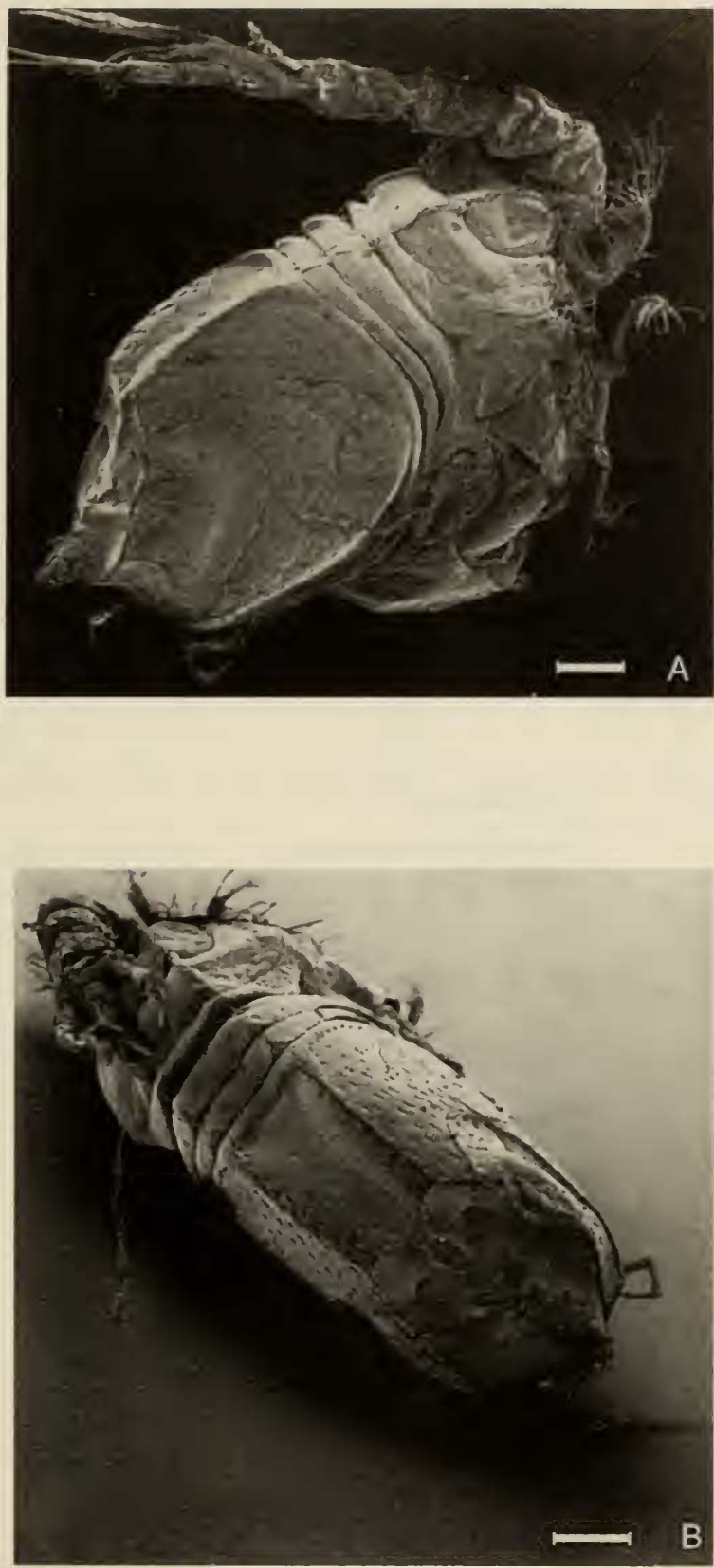


Fig. 1. *Gynodiastylis laciniacristatus*, new species. Ovigerous ♀ (not the same individual as Figs. 2–5); A, habitus; B, dorsal view. Scale bars are 200 microns in length.

ticles together, posterior margin bearing many simple and 2 plumose setae, posterodistal corner produced as 3 teeth, anterior margin bearing 1 simple seta, lined with

fine hair-like setae, anterodistal corner bearing 2 plumose setae; ischium 0.5 length of merus, posterodistal corner produced as tooth; merus produced as 3 small teeth on

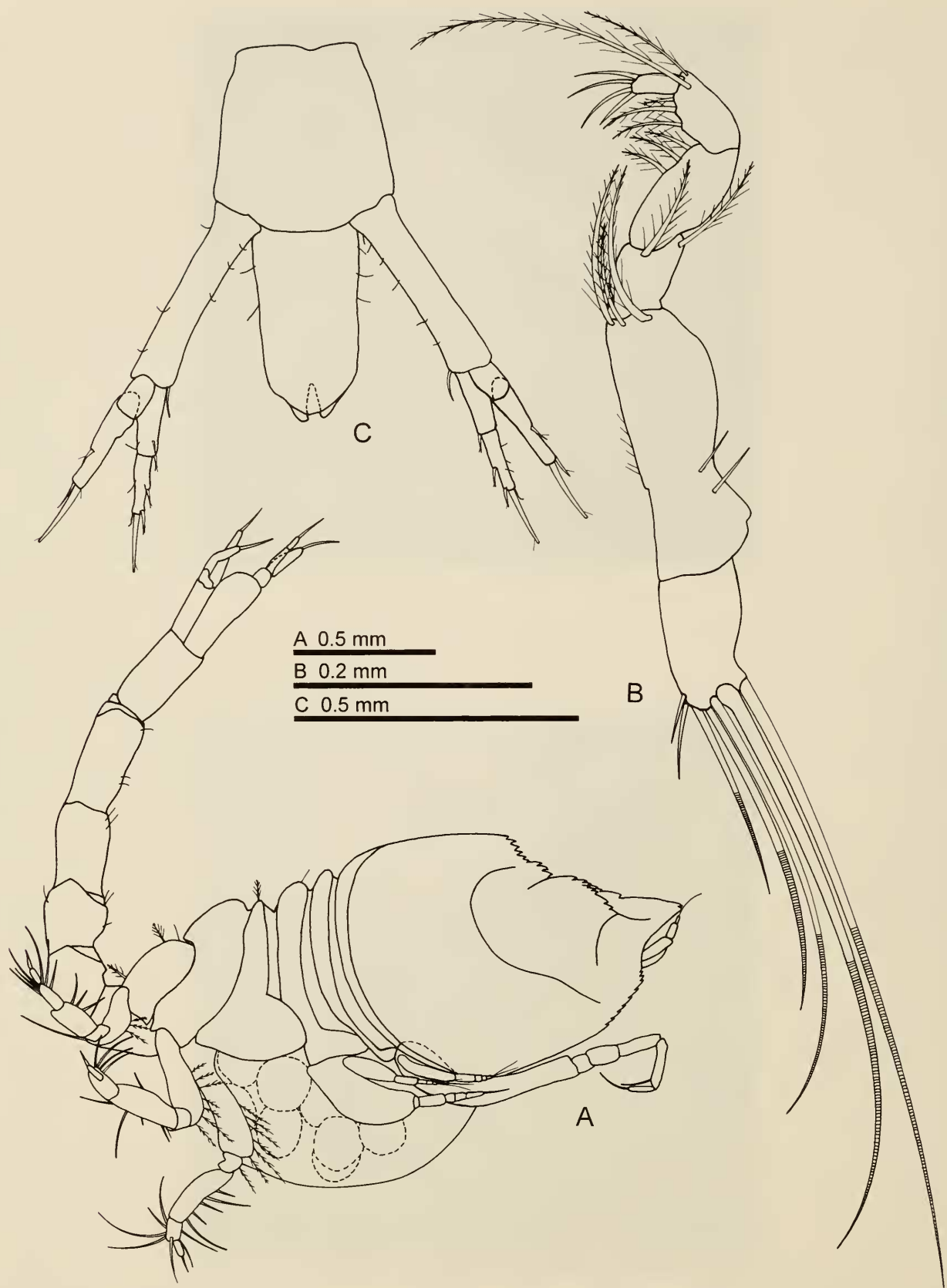


Fig. 2. *Gynodiastylis laciniacristatus*, new species. Ovigerous ♀ paratype NMV 45434; A, habitus; B, maxilliped 2; C, telson and uropods.

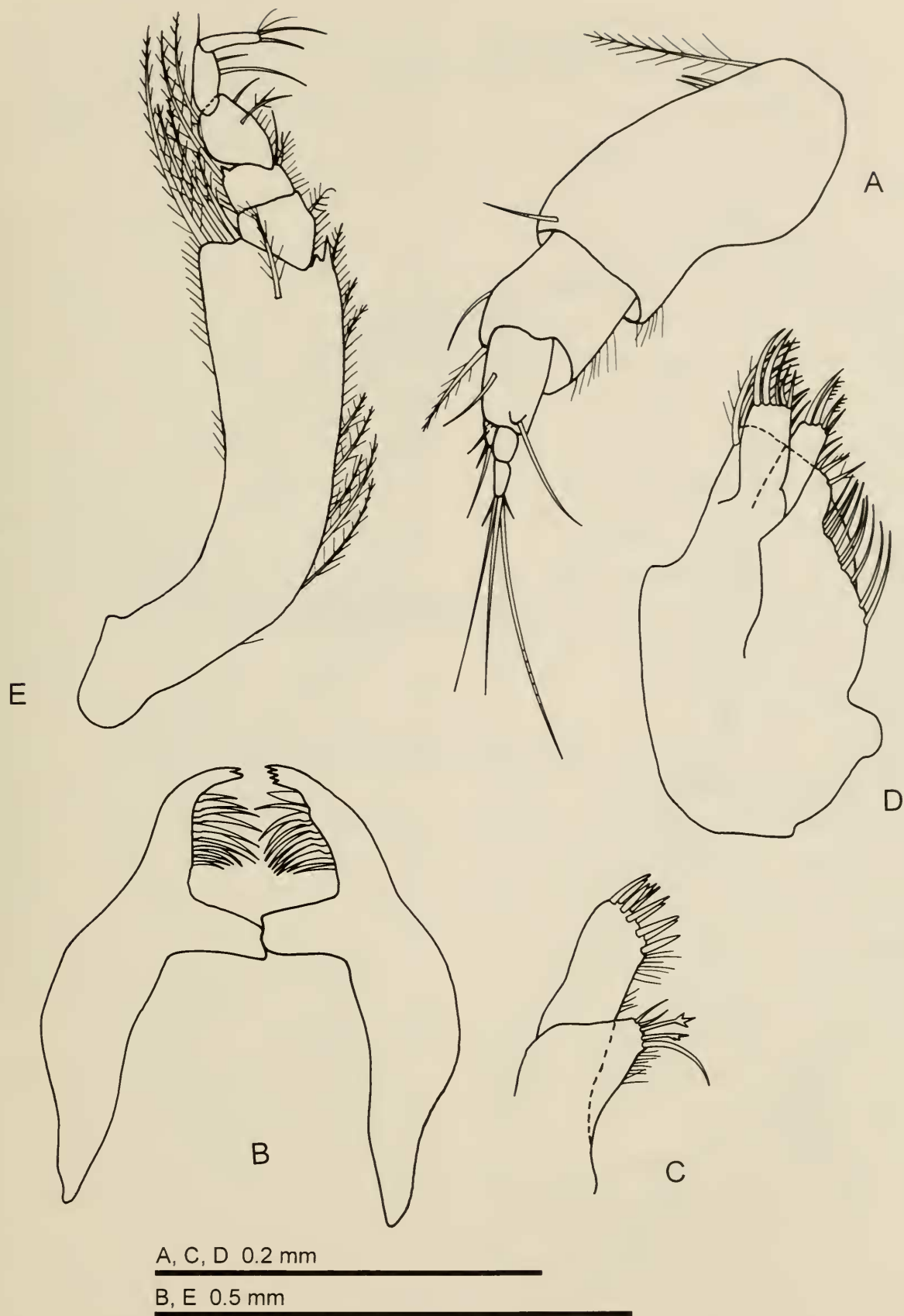


Fig. 3. *Gynodiastylis laciniacristatus*, new species. Ovigerous ♀ paratype NMV 45434; A, antennule; B, mandible; C, maxillule; D, maxilla; E, maxilliped 3.

posterior margin; carpus subequal to propodus; propodus twice dactyl length, bearing 1 long and 1 short simple setae distally, single small simple seta proximally; dactyl bearing 1 long and 1 short simple setae terminally; exopod 0.5 length basis, basal article bearing 2 simple setae, produced as small tooth distally; flagellum bearing 6 long stout plumose setae (Fig. 4A).

Pereopod 2 basis longer than all other articles together, 3 times ischium width, margins lined with many simple setae, anterior margin produced as multiple teeth; ischium reduced, unarmed; merus twice carpus length, anterior margin produced as multiple teeth, bearing 2 simple setae; carpus anterior margin produced as 2 teeth, bearing 2 simple setae; propodus subequal to carpus, unarmed; dactyl slightly longer than propodus, bearing 3 simple setae terminally; exopod subequal to basis, basal article unarmed, flagellum bearing 4 long stout plumose setae (Fig. 4B).

Pereopod 3 basis as long as next 2 articles together, anterior margin produced as multiple teeth, bearing 5 plumose, 1 annulate and 2 annulate plumose setae, posterior margin bearing 2 simple setae; ischium 0.2 length merus, bearing 1 simple seta; merus twice carpus length, bearing 2 annulate and 4 simple setae; carpus twice propodus length, bearing 6 annulate and 2 simple setae distally; propodus twice dactyl length, bearing single annulate seta distally; dactyl bearing 2 simple setae terminally; exopod biarticulate, rudimentary, bearing 1 simple seta apically (Fig. 4C).

Pereopod 4 coxa bearing several stout simple setae; basis as long as next 2 articles together, anterior margin bearing 2 plumose, 1 annulate plumose, 7 annulate, and 3 simple setae, produced as multiple teeth distally, 1 plumose seta mid article; ischium 0.3 length merus, unarmed, produced as large posteriorly directed blunt lobe; merus 3 times carpus length, bearing 7 annulate setae, produced as multiple scales, posterior margin produced as 3 teeth; carpus slightly longer than propodus, bearing 7 annulate

setae, produced as 2 teeth proximally; propodus slightly longer than dactyl, bearing 2 annulate setae; dactyl bearing single stout seta with single setule; exopod biarticulate, rudimentary, bearing 1 simple seta apically (Fig. 5A).

Pereopod 5 basis as long as next 2 articles together, bearing 6 plumose, 1 annulate plumose and 1 annulate setae, produced as small blunt processes on posterior margin; ischium 0.5 length merus, bearing 1 simple seta; merus slightly longer than carpus, bearing 5 simple and 1 annulate setae, posterior margin produced as scales; carpus bearing 7 annulate setae; propodus subequal to carpus, bearing 1 annulate seta; dactyl 0.5 length propodus, bearing 1 stout and 1 slender setae terminally (Fig. 5B).

Telson equal in length to pleonite 6, post-anal section negligible, unarmed (Fig. 2C).

Uropod peduncles equal in length to telson, bearing single seta at distomedial corner; rami shorter than peduncles; endopod biarticulate, article 1 bearing 1 short stout seta at distomedial corner, article 2 bearing 2 short stout setae medially, single long seta terminally; exopod biarticulate, article 1 half length article 2, unarmed, article 2 bearing 2 short setae laterally, single long stout seta terminally; all setae on rami bearing single thick setule apically (Fig. 2C).

*Etymology*.—*laciniacristatus* from the Latin *lacinia*, meaning jagged and *crista*, meaning ridge.

*Remarks*.—*Gynodiastylis laciniacristatus* is distinguished from all other *Gynodiastylis* by the large blunt process on the ischium of pereopod 4. *Gynodiastylis laciniacristatus* is superficially similar to both *G. ornata* Hale, 1946 and *G. mutabilis* Hale, 1946. However, there are obvious differences in addition to the process on pereopod 4. Neither *G. ornata* nor *G. mutabilis* have exopods on pereopods 3 and 4 of the female, while they are present in *G. laciniacristatus*. The uropod endopod in *G. mutabilis* is uniarticulate, while in *G. laciniacristatus* the uropod endopod is biarticulate. The lateral margins of the telson in



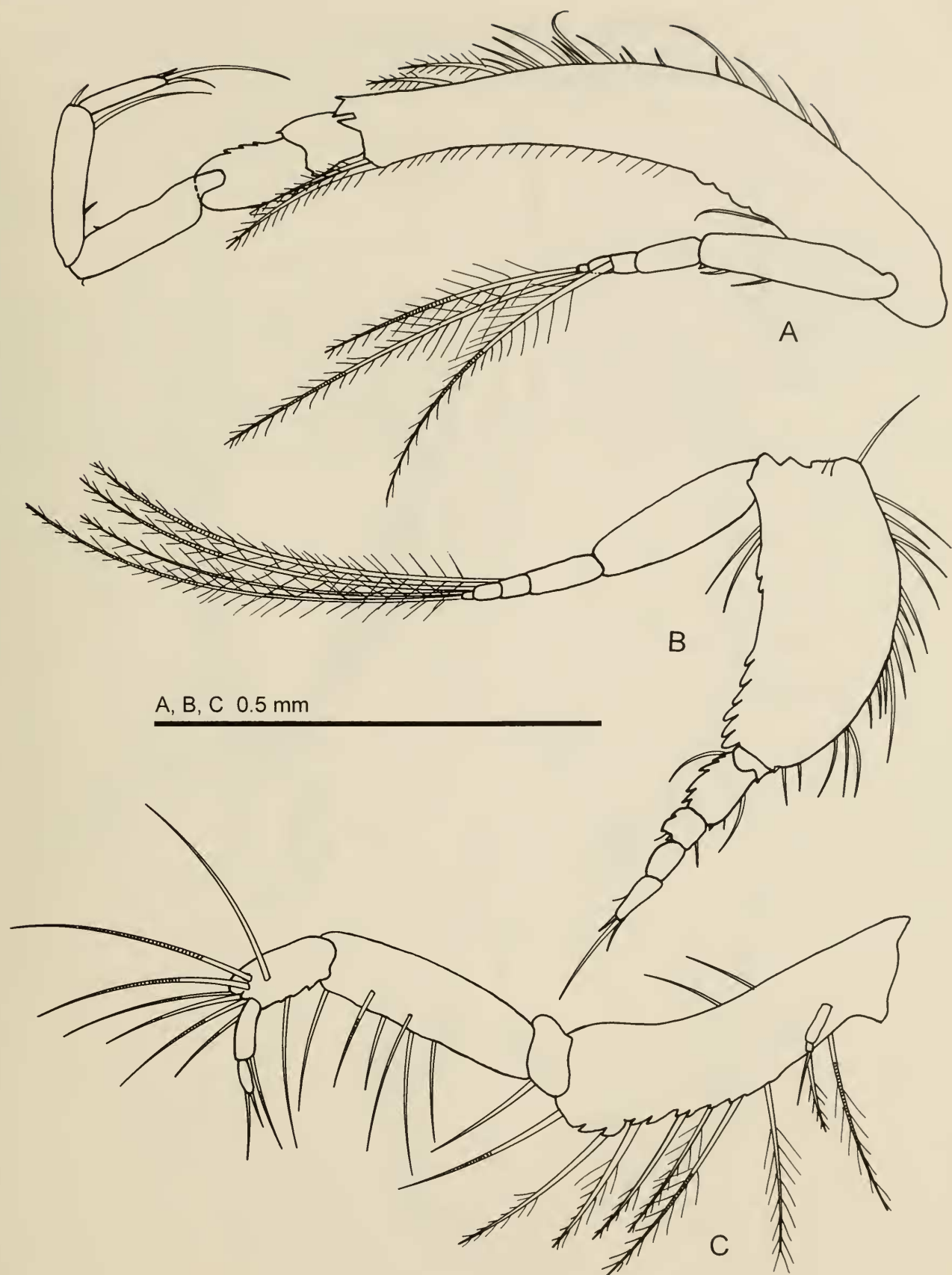


Fig. 4. *Gynodiastylis laciniacristatus*, new species. Ovigerous ♀ paratype NMV 45434; A, pereopod 1; B, pereopod 2; C, pereopod 3.



Fig. 5. *Gynodiastylis laciniacristatus*, new species. Ovigerous ♀ paratype NMV 45434; A, pereopod 4; B, pereopod 5; C, maxilliped 1.



*G. mutabilis* are produced as at least one pair of teeth, while in *G. laciniacristatus* the telson lateral margins are entire. The carapace of *G. laciniacristatus* has a distinct anterolateral prominence produced as a sharp corner, while *G. ornata* has no such prominence.

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